UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,265	03/12/2004	Tyler Lowrey	2024.46	7228

7590 09/05/2007

Philip H. Schlazer
Energy Conversion Devices, Inc.
2956 Waterview Drive
Rochester Hills, MI 48309

EXAMINER	
CAO, PHAT X	

ART UNIT	PAPER NUMBER
2814	

MAIL DATE	DELIVERY MODE
09/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/799,265	LOWREY ET AL.	
	Examiner	Art Unit	
	Phat X. Cao	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,7-9,16-23,25,26,29-33,35,36,39-53 and 58-97* is/are pending in the application.

4a) Of the above claim(s) *76-87* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,7-9,16-23,25,26,29-33,35,36,39-53,58-75 and 88-97* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The Request for Continued Examination in Paper filed on 7/2/07 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 7-9, 16-23, 25-26, 29-33, 35-36, 39-53, 58-75, and 88-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagashima (US 5,312,773) in view of Harshfield (US 6,031,287).

Regarding claims 1, 7-8, 18, 20, 23, 30, 33, 41, 47 and 53, Nagashima (Figs. 2-7) discloses a method of making an electrically contact element, comprising: providing a first dielectric layer 34, the first dielectric layer 34 having an opening, the opening having a sidewall surface and a bottom surface; forming a conductive layer (42,44) on the sidewall surface and on a portion of the bottom surface of the opening, the portion being less than the entire bottom surface (Fig. 3); forming a second dielectric layer 46 (column 4, lines 3-7) on the conductive layer (42,44), the second dielectric layer 46 contacting the bottom surface of the opening (Fig. 4); and forming upper level wiring conductor 50 in electrical communication with the conductive layer (42,44) (Fig. 7).

Nagashima does not disclose that the upper level-wiring conductor 50 is a phase-change programmable resistance material made of chalcogenide.

However, Harshfield (Fig. 24) teaches the forming of a phase-change programmable resistance material 130 of chalcogenide (column 7, lines 5-12 and column 14, lines 1-5) as an upper level-wiring conductor in electrical communication with a lower level-wiring conductor 106 through a conductive layer 124 (column 13, lines 48-51 and lines 66-67). Accordingly, it would have been obvious to modify the method of Nagashima by forming the upper level wiring conductor 50 with a phase-change programmable resistance material because such a forming of the phase-change programmable resistance material for the upper level wiring conductor would provide a memory cell for a programmable memory device, as taught by Harshfield (column 14, lines 1-5).

Regarding claims 9, 29 and 39, Nagashima further discloses that the first dielectric layer 34 and the second dielectric layer 46 are formed of the same silicon dioxide material (column 3, lines 21-22 and column 4, lines 3-7).

Regarding claims 16, 21, 31, 42 and 48, Nagashima further discloses that the forming conductive layer (42,44) comprises substantially conformally depositing the conductive layer (42,44) on the sidewall surface and the bottom surface (see Fig. 2).

Regarding claims 17,19, 22, 32, 40, 43, 45, 49 and 51, Nagashima further discloses that the removing step comprises substantially anisotropically etching such as reactive ion etching (column 3, lines 59-63) to form a conductive sidewall spacer (42,44) (see Fig. 3).

Regarding claims 25-26, 35-36, 44, 46, 50 and 52, Nagashima (Fig. 4) also discloses that the sidewall surface is the sidewall surface of the first dielectric layer 34,

the second dielectric layer 46 is formed on the conductive layer (42,44) after the removing step, and the second dielectric layer 46 is formed before the forming the upper level wiring conductor 50 (see Fig. 7).

Regarding claims 58, 60, 63, 64, 69 and 72, Nagashima (Fig. 7) also discloses that the conductive layer (42,44) has an area of contact with the upper level-wiring conductor, the area of contact having a dimension of about 500 Angstroms (column 3, lines 51-55).

Regarding claims 59, 65, 68 and 73, Nagashima further discloses that the portion of the bottom surface is a surface of a conductive substrate 32.

Regarding claims 61-62, 66-67, 70-71, and 74-75, Nagashima (Fig. 7) further discloses that the conductive layer (42,44) comprises a dual-layered conductive sidewall spacers 42 and 44 of Ti/TiON (column 5, lines 55-57), one layer having a resistivity being less than the resistivity of the other.

Regarding claims 88-97, Nagashima (Fig. 7) further discloses that the conductive layer (42,44) contacts the bottom surface of the opening and the dielectric material 46 fills the opening.

Response to Arguments

4. Applicant's arguments with respect to amended claims have been considered but are moot in view of the new ground(s) of rejection.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is 571-272-1703. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. X. C./

/Phat X Cao/
Primary Examiner, Art Unit 2814